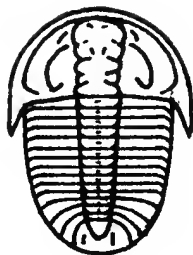


# THE FOSSIL COLLECTOR

BULLETIN N°1      JANUARY 1980



## PROVISIONAL SECRETARY

F.C. Holmes, 15 Kenbry Rd., Heathmont, Vic. 3135

## REPRESENTATIVES

### AUSTRALIAN CAPITAL TERRITORY:

Mrs. M. Webb, Fairlight Stn., R.M.B. 141 via WODEN, 2611

### NEW SOUTH WALES:

Mrs. R. Rowe, 19 Rees St., Belmore, 2192

### NEW ZEALAND:

Mrs. N. Giles, 1006 Sussex St., Hastings, N.Z.

### QUEENSLAND:

I. Sobbe, M/S 422, Clifton, 4361

### SOUTH AUSTRALIA:

D. Aslin, 80 Haines Park Rd., Banksia Park, 5091

### TASMANIA:

Mrs. D. Vincent, 6 Caroline St., Launceston, 7250

### VICTORIA:

F.C. Holmes, 15 Kenbry Rd., Heathmont, 3135

### WESTERN AUSTRALIA:

Mrs. L. Schekkerman, 3 Pascoe St., Karrinyup, 6018

Published by

THE FOSSIL COLLECTORS ASSOCIATION OF AUSTRALASIA

## EDITORIAL

It is nearly a year since a notice was placed in the February/March 1979 issue of the "Australian Gems and Crafts Magazine" that a National Fossil Collectors Group was to be formed.

At that time it was simply our aim to produce a register of interested persons which would allow individuals to correspond, exchange information and form new friends.

With the encouragement of David Aslin, Ian Sobbe and Jim Robinson, amongst others, and the interest shown by all of you who attended the inaugural meeting at Tanunda, we have produced our first full Bulletin, something considered only a vague dream a year ago.

As our membership is spread over millions of square kilometers, it will be difficult, if not impossible to continue the standard we have set without help from each one of you.

For the Bulletin we need articles both technical and general, news of members activities, details of local finds, newspaper reports, information on publications, in fact anything you consider would be of interest to your fellow members. As we stated in our last newsletter "Don't worry about the grammar or punctuation if thats not your strong point, we can do the editing as long as you supply the information".

The other main area in which you can help, is with publicity. We need as many members as possible, provided of course they are genuinely interested in fossil collecting and the study of palaeontology. All we ask is that you tell you friends about the Association.

Finally, on a personal note I would like to thank all of you who have written over the last year and offered your support and encouragement. I must apologize for not personally answering all your letters, but hope over a period of time wherever possible your questions and suggestions will be answered or acted upon.

FRANK HOLMES

## RESPONSIBILITY

One of the main aims of our Association is to encourage amongst members a responsible and scientific attitude to the collection and classification of fossils, and a realization of the need to preserve fossil collecting localities, many of which are of world wide importance.

In a "Forward" to the publication "Regional Guide to Victorian Geology", Tom Darragh now Deputy Director of the National Museum of Victoria, wrote,

"To many 'conservation' applies to animals and plants or the environment around them, but how many of us regard the geological features of the environment as worthy of conservation? A moment's reflection will show that geological features are more vulnerable, as once despoiled they are not regenerated, as are living organisms.

In some overseas countries, notably Britain and the United States many geological features such as fossil and mineral localities have been ruined by over-zealous collectors, and public access to many such sites is now restricted. Localities have been overwhelmed with hammer-bearing groups of students and club members, and literally hacked to pieces and carried away by persons with no thought for the future."

He goes on to say that "with a few outstanding exceptions this situation has not yet arisen here". However, this was written in 1973 and although to a large extent it may still be true of fossil localities, those of us that are also interested in minerals will know only too well the number of localities that are now closed to collectors, not just by Government or Local Authorities but by irate property owners.

While the blame is usually placed on the student and amateur collector, commercial interests and even local authorities are anything but blameless as is shown by the recent Yea Shire Council's desecration of the Baragwanathia plant beds some 78 kilometres N.E. of Melbourne.

If we are to collect fossils, and no one can be naive enough to believe that any amount of resistance on behalf of certain professionals or legislation by Governments will stamp out such a hobby, then we must see that we "do not hammer or dig out crops

Continued next page.

## RESPONSIBILITY (Cont'd)

irresponsibly or collect specimens which will later be thrown away" because of lack of interest or knowledge of the importance of our finds.

As Mr. Darragh states "since many fossils are scarce and often scientifically valuable they should be shown to a professional palaeontologist from the Geological Survey, Museum or one of the Universities. In this way you can contribute something to the science of palaeontology as many have in the past".

In particular, remember that a broken fragment of bone or shell, a poorly preserved imprint of a plant or graptolite can be more important than a perfectly preserved specimen, if it is of a genus or species never before recorded in the particular locality you are working. Probably more destruction is done by people trying to find the perfect specimen than in any other way.

Finally, a fossil from an unknown location is merely a curiosity it is of little or no value to a true collector amateur or professional.

In future issues we aim to publish articles on collecting techniques, recording, preparation, cleaning and preservation.

## F.C.A.A. EMBLEM

All of you will have noticed from our earlier Newsletters, that we have chosen a Trilobite as our emblem.

The particular Genus that will be illustrated on our Car Stickers, Letterheads and Bulletins, is XYSTRIDURA, the most common of the Trilobites found in the Beetle Creek Formation (Templeton River area), west of Mount Isa, Queensland.

The illustration should be reasonably accurate having been drawn from two photographs and a group of actual specimens.

Other details that may be of interest are:-

Order .... Redlichiida

Genus & Species .. Xystridura saintsmithi

Age .... Lower Middle Cambrian

## FINANCES

A bank account (No. 911219) has been opened at the Commonwealth Savings Bank of Australia, 367 Collins Street, Melbourne, Victoria, in the name of the "Fossil Collectors Association of Australasia".

Income and Expenditure to the 6th January, 1980 (excludes costs associated with this Bulletin) was as follows:-

### Income

Stamps and cash	\$ 20.80
Subscriptions	\$128.00
Donations	\$ 5.60

---

\$154.40

---

### Expenditure

Postage (incl. two newsletters)	\$26.85
Printing pamphlet/ applic. form	\$11.00
Stationery	\$10.09

---

\$47.94

---

This leaves a balance of \$106.46 in hand to cover (we hope) the cost of three bulletins. Further subscriptions will improve the situation rapidly, as apart from postage costs, once the bulletin has been set up for printing, additional copies cost little more than the value of the paper.

The Nunawading and District Lapidary Club has offered to print this first bulletin free of charge for which we are extremely grateful. We have also acquired envelopes at no cost, so at least we are off to a good start.

## CAR STICKERS

We have worked out a tentative design for a car sticker and obtained an approximate idea of cost. When we can finalize the art work we will get a firm price and see if the initial outlay can be recouped within a reasonable period at a charge of say 60 cents a sticker.

Maybe we will have to wait until our membership builds up around the 150 mark before we can justify the financial outlay, anyway we will let you know what further progress we have made in the next Bulletin.

## IN THE NEWS

Not since 1972 when the footprints of one of the earliest land vertebrates (ICTHYOSTEGA) were found in the Genoa River area of East Gippsland, has the Melbourne press carried so much "news" of fossil discoveries. What's more interesting are the follow up stories and in some cases television coverage.

Is it too much to hope that there is an awakening in the community to matters palaeontological!

The three main stories of 1979 which have hit the "headlines" are -

### The Dinosaur Search

Reports, early in the year, of numerous dinosaur bones being found near Eagles Nest to the East of Cape Patterson.

Tim Flannery, a student from Monash University, in conjunction with the National Museum of Victoria, has been responsible for the majority of the 60 or so bone or bone fragments found.

The coastal cliffs which yielded the bones are generally composed of Lower Cretaceous arkose (felspathic sandstone) and were the site of Victoria's first dinosaur bone find back in 1903. The original find, a claw of a carnivorous dinosaur and the more recent discovery of a reptilian humerus, believed to be from a small theropod, were the only previously known remains of dinosaurs in Victoria, in spite of the extensive areas of Cretaceous sedimentary rocks in South Gippsland and the Otway Ranges.

Some of the bones unearthed have been tentatively identified as belonging to a dinosaur of the Hypsilophodon group (small herbivorous bird-hipped dinosaurs), while a footbone is reported to be from an Allosaurus (11 to 12 metre long flesh-eater).

Since these finds in South Gippsland, the search for more evidence of Victoria's past inhabitants has switched to the Cape Otway coastline stretching west from Lorne. The current expedition is made up of paleontologists from the Queensland Museum, the University of New South Wales, Monash University and the National Museum of Victoria.

A report in the press dated December 29th, '79 states that in four weeks the dig has yielded about 40 bones including a tooth from either a crocodile or a pterodactyl. If it proves to be from the latter it will be the first evidence of this pre-historic "flying" reptile in Australia. The most interesting find, which resulted in the headlines "Bone leaves boffin baffled", was of a 30 cm long slim curved bone of unknown lineage.

Casts of the bone are to be sent overseas to assist in identification. Other bones found, match up with specimens previously described from Cape Patterson.

(NOTE - We hope we can persuade Tim Flannery and possibly Tom Rich, Curator of Vertebrate Fossils, National Museum of Victoria to write us an article on these finds for future publication).

## "Trunked" Ancient

Article in "The Age" on Dr. Tom Rich's theory that the diprotodon was not the stubby nosed creature shown in previous illustrations of this giant wombat like marsupial, but did in fact have a trunk like an elephant.

The theory is based on the two deep pits in the bone below the nose opening, where powerful trunk muscles could have been anchored. Prior to the discovery of a virtually complete skull (one of 12) dug from a Bacchus Marsh clay quarry during the last few years, paleontologists had only fragmentary skulls from which to form their impressions of external appearance.

## "Fossil find bulldozed to make roads"

On July 28th 1979 the Melbourne "Sun" published a two column article and a full page of pictures describing the bulldozing of a unique fossil plant bed on the Limestone Road near Yea in Victoria.

The excuse given by a Council employee, was that the road-building rock was of great importance to the area and represented an investment of about \$2,000 in council equipment costs. There would have been some excuse had the Shire not been aware of the unique importance of the site and had there not been any other source of rock. As it is the whole area is composed of the same type of silt stone and in fact the Shire are now working another

Continued next page.

## IN THE NEWS (Cont'd)

locality about a kilometre further down the road (incidentally much nearer the section of road being re-constructed).

The fossil plants from this area are known as the "Baragwanathia Flora" consisting primarily of the earliest known Lycopod, *Baragwanathia longifolia*.

The debate and research into the age and classification of this flora has been going on since a publication in 1935 by Lang and Cookson.

Currently Ms. Jackie Tims from Melbourne University is studying the flora under the watchful eye of Dr. Jack Douglas a supervising geologist from the State Minerals and Energy Department.

A paper on the dating of the fossil beds "New evidence for a Silurian (Ludlow) age for the earliest *Baragwanathia* flora" by Michael J. Garratt, also from the Minerals and Energy Department, has recently been published in "Alcheringa".

While there are other localities in Victoria where *Baragwanathia* are found, this particular locality and one other further to the N.W. are now known to be much older than the first discoveries on the Yarra Track above the Upper Yarra Dam (Lower Devonian). Their importance and value in piecing together the evolution of the first land plants can not be overstated. As Jackie Tims is quoted as saying "the Shire's actions were the equivalent of burning a collection of Rembrandts". To be fair we should add that had the old road not been cut into the top of the hill, it is unlikely the deposit would have been discovered in the first place. It is however interesting to note that the locality is described by Harris and Thomas in a 1941 article on the area and managed to stay "whole" apart from the new road cutting for 40 years or so.

As a postscript "The Sun" on 15th November, 1979 reported the Victorian Minister for Conservation Mr. Houghton as saying "an agreement had been reached with the council for it not to proceed with damaging the fossil bed." - It's unlikely the Council would have bulldozed below the level of the road cutting anyway and there's nothing left of the 4 metre high bank that contained the narrow fossil band.



## QUESTION TIME

1. Can anyone verify that the graptolites illustrated below are *Tetragraptus serra* (Fig. 1) and *Tetragraptus bryonides* (Fig. 2)? Both specimens are from a locality on the old section of the Fryerstown-Campbells Creek Road, near Castlemaine, Victoria. They are found associated with *Tetragraptus fruticosus* (3 br.) and a species of *Phyllograptus* probably *Phyllograptus* Sp.

FIG. 1. (N.T.S.)

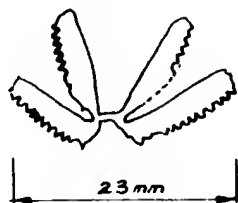
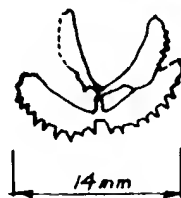


FIG. 2. (N.T.S.)



2. Is there a difference between the Tertiary echinoids *Lovenia forbesi* (Tennyson Woods) and *Lovenia woodsii* (Etheridge)?

We echinoid collectors have been puzzling over this for ages. The "Geology of Victoria" refers to *Lovenia woodsii* from the Black Rock Sandstone (Beaumaris) while the "Geology of the Melbourne District, Victoria" refers to them as *Lovenia forbesi*.

The specimens from Torquay-Point Addis-Airey's Inlet are listed as "forbesi" yet to us amateurs seem to be the same as those from Beaumaris.

Please can someone put us out of our misery and if there is a difference - illustrate it.

3. Taxonomic Nomenclature: Recent phone call from an old friend (who isn't a fossil collector) asking the correct spelling of a fossil name, brought to attention the problems we non-scholastic types have with word terminations.

There in one book was a list of terminations extending from Class to Subfamily, complete with a perfect example. However on checking examples from different phyla it became very obvious that no other examples seemed to follow the list completely; so whatever anyone tells you to the contrary, there is no universally used list of taxa endings. Even with

Continued next page.

## QUESTION TIME (Cont'd)

the Class which nearly always ends with "a" we have Aves (Birds) to upset the rule.

The most consistent of all is the ending "idae" used after the Family name. Trilobites, you will note elsewhere in this Bulletin, do have all the Orders ending in "ida", but this is about as far as it goes.

Just for the newcomers we list the main levels of Classification with a couple of typical examples, i.e. Man and a Trilobite (Phacops).

KINGDOM:	Animal	Animal
PHYLUM or DIVISION:	Chordata	Arthropoda
CLASS:	Mammalia	Trilobita
ORDER:	Primate	Phacopida
FAMILY:	Hominidae	Phacopidae
GENUS:	Homo	Phacops
SPECIES:	sapiens	rana

If you have a question to ask or even a question and answer which you consider will help clear up doubts in the minds of our members, send them to the Provisional Secretary for inclusion in our next issue.

Even though it is doubtful if we can publish photos initially, we most certainly can prepare drawings from photos and touch up your sketches if your artistic ability is not up to your palaeontological enthusiasm.

## GIANT AMMONITE FIND

Nancy Giles our New Zealand representative has forwarded us a newspaper article by William Gasson on the 1977 discovery of a giant ammonite in the Waikato area of the North Island.

Mrs. Jean Gyles a rockhound from the New Zealand Mineral Club discovered the ammonite while on a field trip early in 1977.

Searching for hand sized specimens she came across what was to turn out to be the tip of a 1200 kg. (2640 lbs.) specimen embedded in a road cutting.

After a two year saga of excavation, cleaning and drilling the geological division of the Department of Scientific and Industrial Research has pieced together the 1.45 meter (4'9") wide shell.

D.S.I.R. paleontologist Dr. Graeme Stevens believes the ammonite may have died during a massive volcanic eruption when ash showers fell into the sea smothering life and creating a marine graveyard; the area near Kawhia Harbour then consisting of tiny volcanic islands.

A D.S.I.R. coal survey team in the area hired drills and compressors and after four days of excavation shipped out in six crates 460 kg of shell and rock - what they then believed to be the whole ammonite.

At the Department's Geological Division in Lower Hutt, staff prepared and pieced together the specimen only to find that the 20 odd fragments constituted only about one third of the ammonite.

In February 1978 Dr. Stevens and his colleagues returned to the site and with the aid of Waitomo District Council's quarry manager Mr. Chris Browne proceeded to complete the difficult task of excavation with the careful use of explosives; normal drilling and earth moving techniques having failed.

The article states that the largest known ammonite specimen comes from the Ruhr and the second largest from Rio Grande, however, these are reported to be of Upper Cretaceous age, considerably younger than the 145 million year old New Zealand discovery.

D.S.I.R. staff now plan to construct a special marine display around the reconstructed ammonite and to make from fibreglass the tentacles and exposed part of the body to complete the animal.

## Editors Note

Ammonites, members of the Phylum Mollusca, Class Cephalopoda, had separated from the nautiloids by the Devonian period (400 to 350 million years ago). The number of genera remained fairly small until the Triassic, when a marked proliferation and diversification took place. They almost became extinct at the end of this period, but resurgence in the Jurassic culminated in the maximum development of the group. Their numbers then slowly declined until they finally became extinct at the end of the Cretaceous, approximately 65 million years ago.

(Reference "The Elements of Palaeontology by Rhona M. Black).

## TRILOBITES by Juliet O'Connor

### Definition

Trilobites belong to the phylum Arthropoda and are extinct marine invertebrates which arose and evolved from Cambrian to Permian time - a span of about 300-400 million years. Arthropods are characterised by animals having a segmented protective shell, a modern example being the crab.

### Morphology

The trilobite derived its name from the 3-fold longitudinal division where the axial lobe separates the two pleural lobes. (Fig. 1). At right angles to this anatomical organisation are the transverse divisions of the head or cephalon, the body or thorax, and the tail or pygidium.

(1) The Cephalon is the rigid shield covering the organs of the head and is formed by the fusion of several anterior sections. It is the most significant and characteristic part of trilobite morphology used in identification.

Features of the cephalon include the median raised and lobed area called the Glabella, the eye region and the cheek regions. There are several junctions or sutures between the various parts of the cephalon. These sutures are the defining lines of the 2 types of cheeks. The free cheek is the area of the cephalon to the exterior of the facial sutures which is lost during the growth of the trilobite (when molting occurs), and the fixed cheek, the area inside the suture towards the glabella.

(2) The Thorax is that part of the exoskeleton that is composed of movable, articulating segments. It is also the protective shield for the digestive tract and the circulatory and nervous systems. It consists of a median, axial part and paired lateral outgrowths called Pleurae.

The number of thoracic segments varies with species and growth from juvenile to adult stages. e.g. The Agnostids have a fixed number of 2 segments throughout their lifetime, while later Trilobites vary from 8 to 15 segments in adult specimens. This segmentation enabled trilobites to enrol and thus protect their internal soft parts.

(3) The Pygidium arose from the fusion of a number of somites in the abdominal region. It varies in size remarkably from diminutive in some species to equal to the cephalon in others. Ornamentation can also be extravagant in the form of marginal and axial spines. The anus was apparently borne on the terminal segment of the pygidium.

(4) Appendages - There are a few deposits in which the ventral appendages of trilobites have been recovered, e.g. the Middle Cambrian Burgess Shale of British Columbia. In these deposits the appendages have been pyritised and x-radiography has provided a means of clearly illustrating the function of these limbs. The purpose was 3-fold; walking, swimming and respiration.

X-radiography has also provided information about the digestive and musculatory systems. Some trilobites were evidently filter-feeders as they were not provided with claws or mandibles. A feeding current was created by the rhythical motion of the limbs conveying food particles through a ventral food groove to the mouth.

The muscular system enabled trilobites to move the antennae and appendages, to enroll for protection, to crawl out of the old skeleton during molting and to perform burrowing and reproductive functions.

(5) Eyes - The trilobites were first in developing highly organised visual organs. In fact most modern arthropods still follow a design closely related to that developed by trilobites.

Two types of eye are distinguished. (a) The compound or Holochroal eye and (b) the aggregate or schizochroal eye.

(a) The compound eye consists of closely packed hexagonal lenses (from 100 to 15,000) in direct contact with one another.

(b) The aggregate eye has fewer lenses (from 2 to 400) which are larger and separated by sclerotic tissue. e.g. Phacopids.

The functional distinction between the 2 types of eyes is still a matter of controversy.

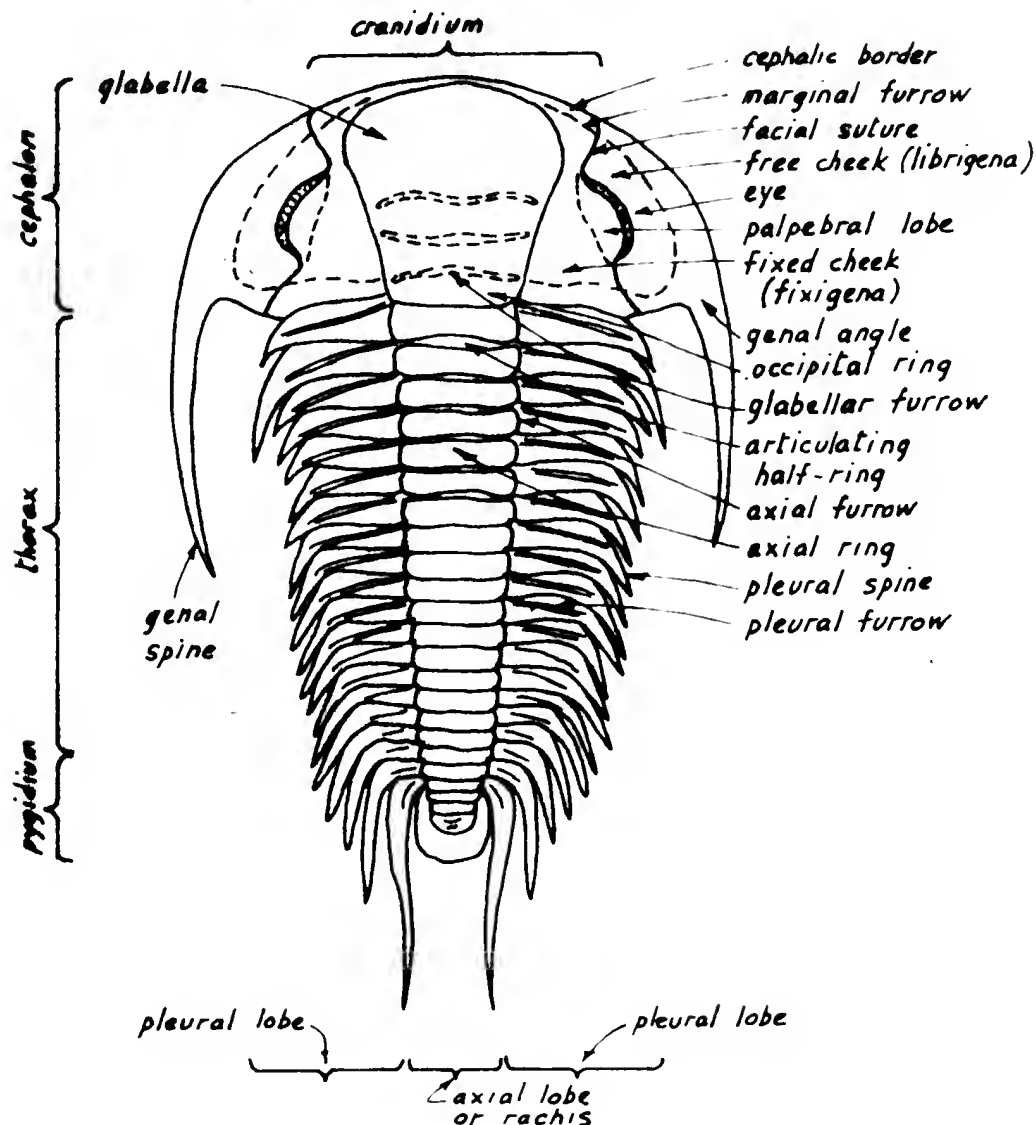
A tendency toward eye reduction and/or loss (i.e. blindness) occurred in many trilobites. Blindness was secondary. Retention in some blind forms of ocular structures exclusive of the visual surface (e.g. protuberances) is evidence of this. Although the

Continued next page.

## TRILOBITES (Cont'd)

reasons for blindness are still disputed, it was apparently unrelated to environment, since blind forms are known among Pelagic, epiplanctonic types and Vagrant Benthos.

**FIG. 1 TRILOBITE TERMINOLOGY**  
DORSAL VIEW OF EXOSKELETON OF  
*PARABOXIDES GRACILIS* (BOECK)



## Trilobite Adaptions

### (1) Molting and Growth

Trilobites begin in a larval stage where gradually the features of the cephalon, thorax and pygidium appear. At the adult stage the maximum number of thoracic segments is attained. This holaspid period is characterised by continuous growth via molting of the exoskeleton. Separation of the exoskeleton occurs along facial sutures in the cephalon and between thoracic segments. Thus in the fossil record the most abundant trilobite remains are the disarticulated segments rather than the complete trilobite.

### (2) Enrolment

The ability to enrol was common to many, but not all trilobites. This involved rolling themselves up so that only the hard carapace was exposed. In this state, various spines became functional, protruding from the enrolled body in a defensive role.

Some of the Cambrian small-tailed trilobites (Olenellids) presumably did not enrol as the small pygidium would have provided little protection for the soft parts of the comparatively large cephalon.

Completely enrolled, a trilobite was effectively invulnerable to most predators. However with the development of fish in the Devonian, enrolled or not trilobites would easily have been crushed and swallowed.

## Classification

The Characteristics of the seven basic orders of trilobites can be seen in Fig. 2.

## Life Habits

Evidence gleaned from the fossil record has told us that trilobites were exclusively marine animals. On the basis of their development of certain adaptations, they must have inhabited a wide range of niches. We can also use faunistic associations and sediment type to determine their life habits.

In general trilobites crawled on the sea floor, leaving well-known trail patterns. Because of their many appendages, actual locomotion for trilobites was a by-product of sifting and reworking the soft substratum in search of food. Some used their appendages to burrow

Continued next page.

## TRILOBITES (Cont'd)

more deeply to reach prey while for others burrowing provided a good resting or hiding place. Some burrowers adapted morphological characteristics for the mode of life, i.e. a smooth exterior reduced friction and a broad axial lobe must have housed powerful appendage muscles essential for efficient burrowing.

In actively swimming trilobites the body tended to be slender and lighter, the pygidium small, and the cephalon hydrodynamically favourable to laminar flow. In general the swimming trilobites had large eyes with a field of view spanning a circular horizon.

## Evolution and Extinction

The greatest diversity of trilobites occurred in the Cambrian and Ordovician. Of the seven trilobite orders, 5 arose in the Cambrian and the other 2 in the Ordovician. No new orders appeared between Ordovician to Permian time.

In terms of millions of years the span of time that each of the 7 orders survived is as follows:-

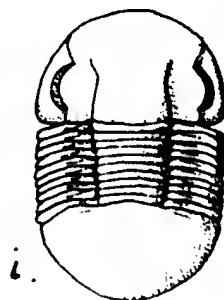
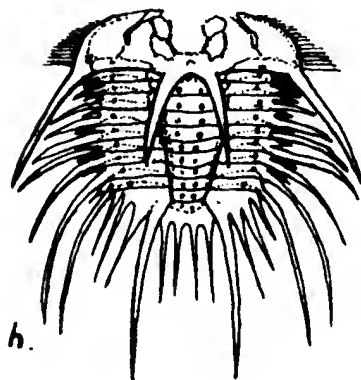
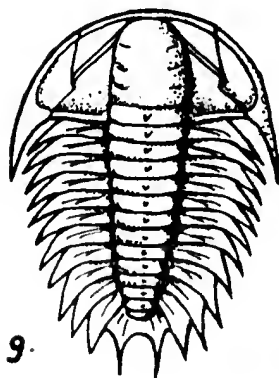
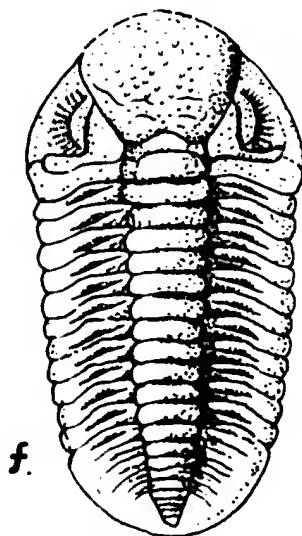
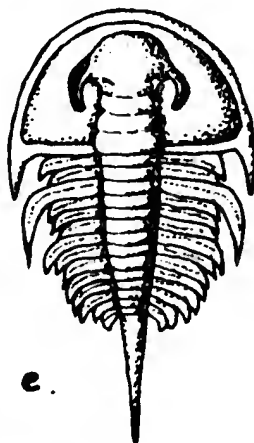
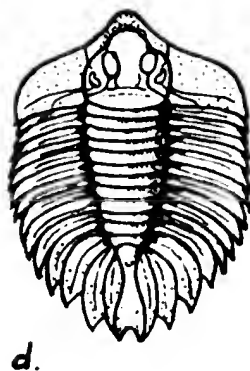
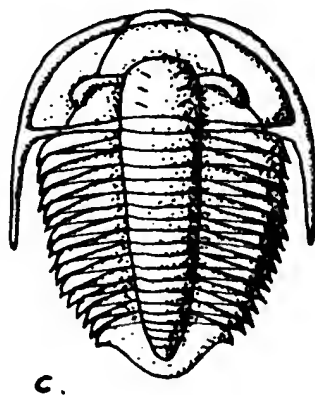
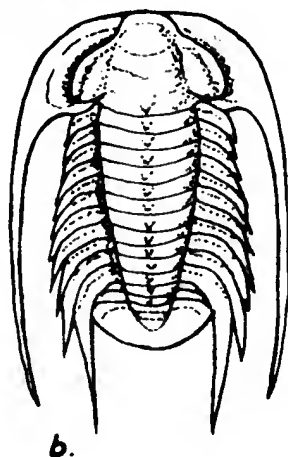
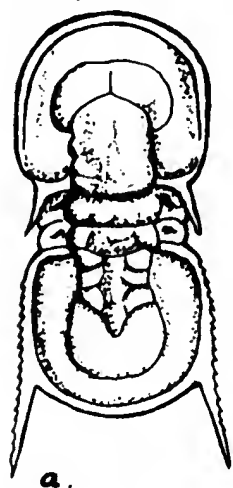
Ptychopariida	-	340
Odontopleurida	-	205
Agnostida	-	175
Phacopida & Lichida	-	155
Corynexochida	-	100
Redlichiida	-	70

In view of this it can be said that trilobite adaptations were successful for long periods of time, and that extinctions should not be viewed as wholly catastrophic events.

Extinction of a phylum should be seen as a group of factors such as over specialisation, geographic isolation and niche changes, over population; development of predators, genetic isolation and mutation, and climatic changes opening or closing migration routes, effecting different species at varying times. Moreover the rapid expansion and success of the trilobites should be emphasised and examined thus helping us to find answers to extinction questions.



## FIG. 2 REPRESENTATIVE TRILOBITES



## Representative Trilobites (Fig. 2)

- (a) Order Agnostida : *Pleuroctenium granulatum* (x 4.5)  
Middle Carboniferous, Bohemia.
- (b) Order Redlichiida: *Bathynotus holopyga* ( x 1)  
Upper L. Cambrian, Vermont.
- (c) Order Ptychopariida: *Olenus* (x 4)  
Lower Cambrian to Upper Ordovician
- (d) Order Lichida: *Arctinurus boltoni* (Reduced) 12 to 15 cms.  
long, Middle Silurian, New York.
- (e) Order Redlichiida: Sub-order Olenellina  
*Olenellus* (x 2), Lower Cambrian.
- (f) Order Phacopida: *Pharcops fecundus* (Reduced),  
Devonian.
- (g) Order Corynexochida: *Olenoides serratus* (x 1)  
Middle Cambrian, British Columbia.
- (h) Order Odontopleurida: *Odontopleura ovata* (x 1)  
Middle Silurian, Bohemia.
- (i) Order Ptychopariida: Sub-order Illaenina  
*Illaenus* (x 1), Ordovician.

## Acknowledgements (Sketches)

Paleobiology of the Invertebrates (Paul Tasch) Fig. 2. (a) (b)  
(f) (g) (h).  
A Guide to Invertebrate Fossils (F.A. Middlemiss) Fig. 2. (c)  
(e)  
The Fossil Book (C.L. & M.A. Fenton) Fig. 2. (d)  
The Elements of Palaeontology (R.M. Black) Fig. 2. (i)  
Trilobites (R. Levi-Setti). Fig. 1. Paradoxides.

## Editors Note:

Bergstrom 1973 lists nine orders, the seven listed above plus the orders Illaenida (usually listed as a Sub-Order of Ptychopariida) and Olenellida (usually listed as a Sub-Order of Redlichiida). Details of the various taxa included by Bergstrom in each order are listed in "Trilobites, A Photographic Atlas" by Riccardo Levi-Setti.

## QUICK QUIZ

1. Which of these is an ancient plant?  
ARCHAEOPTERIS  
ARCHAEOPTERYX  
ARCHEOCETES  
ARCHAEOCIDARIS
2. Which is considered the most important Ordovician index fossil group?  
TRILOBITES  
BRACHIOPODS  
CORALS  
GRAPTOLITES
3. In what geological period is there substantial evidence that the first land plant appeared?  
CARBONIFEROUS  
SILURIAN  
ORDOVICIAN  
DEVONIAN
4. What is the generally accepted age of the planet earth?  
3300 Million Years  
4600 Million Years  
2500 Million Years  
6000 Million Years
5. In what geological period did the dinosaurs become extinct?  
TERTIARY  
JURASSIS  
PERMIAN  
CRETACEOUS
6. Which of the following rocks could never contain fossils?  
SLATE  
CHERT  
GRANITE  
FLINT
7. Could radioactive Crabon 14 dating be used to establish the age of fossil bones 200,000 years old?
8. Which is the odd one out?  
GASTROPOD  
BLASTOID  
NATILOID  
BELEMNITE

Answers Page 23

---

## ADVERTISING

To help cover some of the cost of our Bulletin we are offering Advertising space at the following rates:-

Full page \$7.50 , Half page \$4.00, Quarter page \$2.50 per issue.

Continued next page

## ADVERTISING (Cont'd)

We can reproduce any black and white material and for a small additional cost can prepare the necessary art work.

Members wishing to place personal adverts offering specimens for swapping etc., may do so free of charge. Such adverts should be kept to a maximum of 30 words plus address.

All enquiries should be addressed to the Provisional Secretary (address on page 1).

## FOSSIL GROUP MEETINGS (VICTORIA)

The Nunawading and District Lapidary Club Fossil Group meetings are open to members of our Association on payment of a nominal 50 cent fee per session.

Meetings are normally held at 8 p.m. on the first Thursday of each month (excluding December and January) in the clubrooms to the rear of the Nunawading Community Youth Centre, Silver Grove (off Springvale Road), Nunawading.

Due to the first Thursday in March and April immediately preceding the Labour Day long weekend (Swan Hill Gemkhana) and Good Friday respectively, there will be no formal meetings for these two months.

Any member interested in attending or requiring further information about the above Group should ring Frank Holmes (03) 729 5672 or Jim Robinson (03) 288 7701.

## BOOK REVIEWS

With each Bulletin we hope to include a short book list and of course reviews of new books on fossils and allied subjects. As this is our first issue we will concentrate on books of a general nature particularly those suited to the comparative newcomer to our hobby.

FOSSILS, A Guide to Prehistoric Life by Frank Rhodes,  
Herbert Zim and Paul Shaffer.  
Published by Golden Press, New York, 1962.  
Recommended Retail Price: \$1.95.

Like all Golden Guides, this pocket book is excellent value for money and a must for the beginner and those of us who need a quick and uncomplicated reference to basic palaeontology. As well as a brief look at the evolution of life and a systematic survey of typical groups of invertebrate fossils, it includes sections on vertebrate fossils, plants, how fossils are formed and of course, where to look.

Beware however, as you must with all books that give a general illustration of a fossil genus. Just because you have a specimen which looks similar to the illustration, it does not necessarily mean it is the same. Locality, age and even detailed structure are more often than not necessary to obtain a proper identification.

AUSTRALIAN FOSSILS, by Douglas Stone and Sharman Bawden.

Published by Golden Press, Sydney, 1975.

Recommended Retail Price: \$1.50.

Contains some first class photos of typical Australian Fossils but little technical information. The locality maps with luck would put you within 100 kilometres of a collecting site. A disappointing publication considering its one of the few of a general nature produced in this country.

A STUDY OF FOSSILS, by J. F. Kirkaldy.

Published by Hutchinson Educational Ltd.,  
London, 1963 (Rev. 1971).

Recommended Retail Price: \$7.40.

This soft cover book is one of the Hutchinson Biological Monographs which seems to appear on the bookstands from time to time.

It is particularly interesting for the comparative newcomer in that it contains chapters on "The Rocks that Contain Fossils" and "The Nature and Preservation of Fossils" as well as an excellent and simple to follow section on "The Succession of Life". Other chapters deal with the various ways in which palaeontological information can be used to build up a picture of past environmental and climatic conditions.

FOSSILS FOR AMATEURS, A Handbook for Collectors by

Russel P. Mac Fall and Jay Wollin.

Published by Van Nostrand Reinhold Company,  
New York, 1972.

Recommended Retail Price: \$8.95.

Continued next page.

## BOOK REVIEWS (Cont'd)

As the publishers so rightly point out on the back cover, this is not a book for the bookshelf but the knapsack and workbench. It is a practical book on how to find, collect, classify, prepare and exhibit fossils and is equally as useful to the beginner as it is to the experienced collector. It is delightfully written and the 200 or so photographs and drawings not only illustrate the various fossil families, but more importantly shows you the nature of fossils, preparation techniques and the types of terrain in which fossils are likely to occur.

If you have to limit the size of your library, make sure this is NOT one of the books you leave out.

ANCIENT AUSTRALIA, The Story of Its Past Geography and  
Life by Charles Laseron, Revised by R.O. Brunnschweiler.  
Published by Angus and Robertson, 1969.  
\*(Currently out of print).

Although it is now 10 years since this book was completely revised and over 25 years since it was first published, it is still a valuable source of information on the palaeontological aspects of Australia's Geological history. While it does not contain "exact" locations of fossil beds it lists by geological period all the main types of flora and fauna that existed in this continent and the various sequences in which they are found. This latter information used intelligently can put you on the right path when you head interstate on a fossicking trip.

Although research in the last 10 years may have made some statements in the book open to question they are really of little significance when compared with the vast wealth of knowledge you can glean from this book.

It is written for the layman and hobbyist as well as the student and is not too technical. The only criticism could be levelled at the photographic illustrations - these are not enough and the layout of the descriptions leaves much to be desired.

\* A further revision of this book is underway, however, the publishing date is 1981. In the meantime its the second hand book shops or borrow from your local library.

## BOOK REVIEWS (Cont'd)

EVOLUTION AND THE FOSSIL RECORD, Readings from SCIENTIFIC AMERICAN - W. H. Freeman and Company, San Francisco.

Recommended Retail Price: \$10.95.

This volume contains 20 reprinted articles from Scientific American giving an overview of evolution and the history of life as recorded by the sequence of fossils preserved in the earth's crust.

Amongst this wealth of information are Glassner's 1961 article on the Ediacara fauna "Pre-Cambrian Animals", Robert Bakker's article "Dinosaur Renaissance" which expounds the hypothesis that dinosaurs were not obsolescent reptiles but a novel group of "warm-blooded" animals and Bjorn Kurten's "Continental Drift and Evolution".

While Scientific American is basically directed at the professional scientist, this collection of articles generally are well within the understanding of the dedicated amateur, though you may need to consult a technical dictionary from time to time.

The true fossil buff interested in evolutionary theory will find this a must.

## ANSWERS TO QUICK QUIZ

### 1. ARCHAEOPTERIS

The others in order are a bird, a yoke toothed whale and an echinoid.

### 2. GRAPTOLITES

### 3. SILURIAN

### 4. 4600

### 5. CRETACEOUS

6. GRANITE, an igneous rock formed well below the earth's surface. Note: The occurrence of fossils in slate depends on the degree of metamorphism.

7. NO: CARBON 14 has a half life of only 5730 years which limits its use to dating (organic) material no older than 50,000 years.

8. BLASTOID - Phylum Echinodermata. All the others belong to the Phylum Mollusca.

## LIST OF FINANCIAL MEMBERS AT 1st JANUARY, 1980

### SOUTH AUSTRALIA:

- ANDREW, Russell  
1 William Street, Moonta, 5558
- ASLIN, David  
80 Haines Road, Banksia Park, 5091  
(INT. Tertiary Echinoids of Sth. Aust) PH 263 7364
- CLARK, Donald D  
Andamooka Opal Fields, 5722  
(INT. Archaeocyathinae)
- HILL, Mrs. M  
19 Collins Street, Elizabeth Downs, 5113
- MARSH, Gavin L  
10 Booromi Street, Woomera, 5720  
(INT. Plants and Vertebrates) PH 73 7047
- TEAGUE, Fred A  
Box 14, HAWKER, 5434

### VICTORIA:

- AMESS, Ron  
13 Nichol Street, Hampton, 3188 PH 598 2141
- AMESS, Mrs. Dorothy  
13 Nichol Street, Hampton, 3188 PH 598 2141
- BENNETTS, Garth & Sheila  
P.O. Box 356, Shepparton, 3630 PH 21 2359
- BROWN, Mrs. K.J.  
P.O. Box 79, Echuca, 3625 PH 82 1131
- CAPPADONA, W.J. (Joe)  
1 Clow Street, Dandenong, 3175  
(INT. Marine Fossils, Petrified Wood) PH 792 2629
- CAVILL, Ron & Mary  
15 Shane Crescent, Croydon South, 3136 PH 879 1406
- CRICHTON, Brian G  
6 Ainslie Park Av., Croydon, 3136 PH 723 3219
- DARLING, H.A.  
21 Albion Crescent, Greensborough, 3088
- DONALDSON, Mrs. Ada  
P.O. Box 65, Moe, 3825
- ECKARDT, Steve  
28 Ness Street, Diamond Creek, 3089  
(INT. Devonian invertebrates, Lilydale;  
Tertiary invertebrates, Mornington) PH 438 1092



# THE FOSSIL COLLECTOR

January, 1980

Page 25

- FRANKCOMBE, I  
May Road, Officer, 3809  
(INT. Triassic Flora of Tasmania) PH 707 1159
- HOLMES, Frank & Enid  
15 Kenbry Road, Heathmont, 3135  
(INT. Graptolites, Echinoids, Plants) PH 729 5672
- LAMB, Mrs. Helen  
"Furneaux", Caramut, 3274  
(INT. Tertiary Marine Fossils) PH 99 8295
- MACDONALD, Pat  
35 Haynes Street, Highett, 3190
- MACRAE, Colin  
2 Point Avenue, Beaumaris, 3193
- MITCHELL, Ross  
23 Majdal Street, South Oakleigh, 3167  
(INT. Tertiary Fossils)
- MORAN, Gladys M  
P.O. Box 30, Mount Waverley, 3149  
(INT. Dinosaurs) PH 232 7303
- MORLEY, David  
Flat 3, 27 Herald Street, Cheltenham, 3192 PH 95 1344  
(Office)
- MORLEY, Denis  
616 Warragul Road, South Oakleigh, 3167 PH 570 4860
- ROBINSON, Jim & Karen  
4/18 Tennyson Street, Burwood, 3125  
(INT. Echinoids) PH 288 7701
- SIZELAND, Mrs. Doris  
137 Banyan Street, Warrnambool, 3280
- SMITH, J.A.  
29 Westbrook Street, Chadstone, 3148 PH 277 9963
- SPARROW, R.J.  
6 Griffin Street, East Brighton, 3187
- STEWART, Mrs. Ena B  
60 Price Avenue, Mount Waverley, 3149 PH 232 6152
- VAGG, Stan  
Bookar Wayside, Camperdown, 3260 PH 93 9261
- WALLACE, Brian  
Resthaven Caravan Park, Gilsenan Street,  
Paynesville, 3880
- WALLACE, Malcolm W  
Old Warrandyte Road, North Ringwood, 3134 PH 876 1262
- WANKE, Ronald L  
1074 Heatherton Road, Noble Park, 3174

## VICTORIA: (cont'd)

WOODROFFE, Mrs. Jean

Hunter Street, Rutherglen, 3685

(INT. Palaeozoic invertebrate fossils)

PH 32 9247

YEE, Christopher J

Flat 1, 84 Coleraine Road, Hamilton, 3300

(INT. Muddy Creek, Grangeburn fossils)

PH 72 1733

## NEW SOUTH WALES:

CLARK, Mrs. Betty

7 Clarence Street, Bankstown, 2200

PH 709 7960

CODE, Peter

3 Amarro Avenue, Georges Hall, 2198

COHEN, Greg & Sandy

P.O. Box 270, Greenacre, 2190

COSTER, Allen

88 Alcorn Street, Suffolk Park, Byron Bay, 2481

PH 85 6138

DALE, George

50 Cuzco Street, Coogee, 2034

DAVIDSON, Rene

31 Maling Street, Eden, 2551

PH 61 264

DOYLE, Cyril & Sheila

"Arkoola" R.M.B. 202, West Wyalong 2671

PH 369

HOLLIS, Dr. Julian

c/o The Australian Museum,

P.O. Box A285, Sydney South, 2000

(INT. Ammonites, Echinoids, Trilobites -  
Palaeoecology)

PH 339 8111

JONES, Robert

c/o The Australian Museum,

P.O. Box A285, Sydney South, 2000

PH 339 8324

NOWAK, Eric & Lilo

29 Bungalow Road, Lakemba, 2195

(INT. Permian Brachiopods of Eastern Australia)

RIGBY, Glen

P.O. Box 124, Glen Innes, 2370

PH 1636

ROBINSON, Mrs. Josene

4 Cronulla Street, East Ballina, 2478

(INT. Early Stromatolites)

ROWE, Mrs. Roma

19 Rees Street, Belmore, 2192

PH 78 8348

# THE FOSSIL COLLECTOR

January, 1980

Page 27

## NEW SOUTH WALES: (cont'd)

SMART, M.W.S.

1 Illeroy Avenue, Killara, 2071

(INT. Fossils of the Hunter Valley N.S.W)

PH 498 2988

SPARROW, Florence

c/o P.O. Yanco, 2703

WATSON, Alan & Marce

369 Beamish Street, Campsie, 2194

## AUSTRALIAN CAPITAL TERRITORY:

COLLINS, Clive D.N.

P.O. Box E279, Canberra, 2601

HAYNES, Ian & Karin

21 Roberts Street, Macquarie, 2614

PH 51 4762

THOMAS, Geoff

c/o ANZ Bank,

P.O. Box 371, Canberra, 2601

(INT. Extensive Collection Aust., U.K. & U.S.A

Fossils, Large variety for swapping)

WEBB, John & Merrilee

Fairlight Station, R.M.B. 141 via Woden, 2611

(INT. Brachs, Echinoids, Trilobites, Ammonites,

Corals)

PH 365 123  
(062)

## QUEENSLAND:

BERRY, Lindsay & Marcella

M/S 223 Nobby, via Toowoomba, 4360

(INT. General - wood, palm, plants.

Have Musuem on property)

DOAK, Don

17 McKean Road, Scarness, 4656

HEWITT, Mrs. E.V.

110 Creek Road, Maryborough, 4650

PH 21 3916

MARRIE, Gordon W

134 Thozet Road, North Rockhampton, 4701

PH 28 4822

(INT. Ammonites, Belemnites, molluscs, wood)

SOBBE, Ian & Diane

M/S 422 Clifton, 4361

(INT. Pleistocene vertebrate fossils)

PH 72

TASMANIA:

VINCENT, Mrs. Doreen  
6 Caroline Street, Mt. Pleasant,  
Launceston, 7250

PH 44 2673

NEW ZEALAND:

GILES, Nancy & Frank  
1006 Sussex Street, Hastings, N.Z.

PH 84 272

WEST AUSTRALIA:

SCHEKKERMAN, Mrs. L.C.  
3 Pascoe Street, Karrinyup, 6018  
(INT. Collection of Dutch fossils)

PH 341 6254

NORTHERN TERRITORY:

SULLIVAN, Mrs. Ursula  
P.O. Box 437 Tennant Creek, 5760  
(8 Skipper Street)

WEST GERMANY:

GEBAUER, Dieter  
Römerhof 32, 8940 Memmingen 3

